

Vapor Intrusion Study Summary

Wilcox Oil Company Superfund Site

7-14-16

INTRODUCTION

As part of the Wilcox Oil Company Superfund Site remedial investigation, the U.S. Environmental Protection Agency (EPA) Region 6 and Oklahoma Department of Environmental Quality (ODEQ) will be assessing the potential for impacts to indoor air in residences overlying contaminated source areas. The assessment will include a passive soil gas survey supplemented with a vapor intrusion study at selected residences closest to the source of the contaminant release. EPA's contractors will begin the initial passive soil gas assessment activities towards the end of August, first of September 2016.

The passive soil gas survey will help EPA/ODEQ determine if there is a potential for these vapors to intrude and accumulate in buildings and pose an unacceptable risk. Based on the results of this study, additional sampling may be required to determine if vapors are migrating off-site or how the vapor intrusion pathway may be adequately mitigated.

Passive Soil Gas Survey

Passive soil gas is a screening tool used to identify volatile organic concentrations that have migrated to the surface from the soil or ground water. In this case, the passive soil gas will be used to determine if vapor intrusion sampling is required within residential buildings located within the southern portion of the ground water plume.

Passive soil gas surveys utilize adsorbent samplers that are emplaced below the ground surface to adsorb volatile compounds in soil gas without forcing flow through the soil. Samplers are typically placed in a grid pattern to simultaneously sample trace levels of compounds in soil gas that originate from the contamination in the soil or groundwater.

Soil gas samples will be installed at depths ranging between 12 and 18 inches below ground surface. The passive soil gas samplers will be installed in borings advanced with a hammer drill equipped with a 1-inch diameter bit. The boring will be advanced to the desired depth and the sampler will be lowered into the boring on a retrieval wire. The sampler will be covered with aluminum foil and the boring backfilled with the soil cuttings. A pin flag will mark each location. After a minimum of 14 days, the soil gas samplers will be retrieved by attached wires. The boring will be backfilled with soil after the sample has been retrieved.

Based on the results of the passive soil gas survey, residences may be considered for vapor intrusion sampling.

How Volatile Compounds Affect Indoor Air

If volatile compounds contaminate soil or ground water at a Site, it is important to

evaluate nearby buildings for possible impacts from vapor intrusion. Vapor intrusion occurs when gases from the contaminated soil or ground water seep through cracks and holes in foundations or slabs of buildings and accumulate in basements, crawl spaces or living areas, as shown in the diagram below.

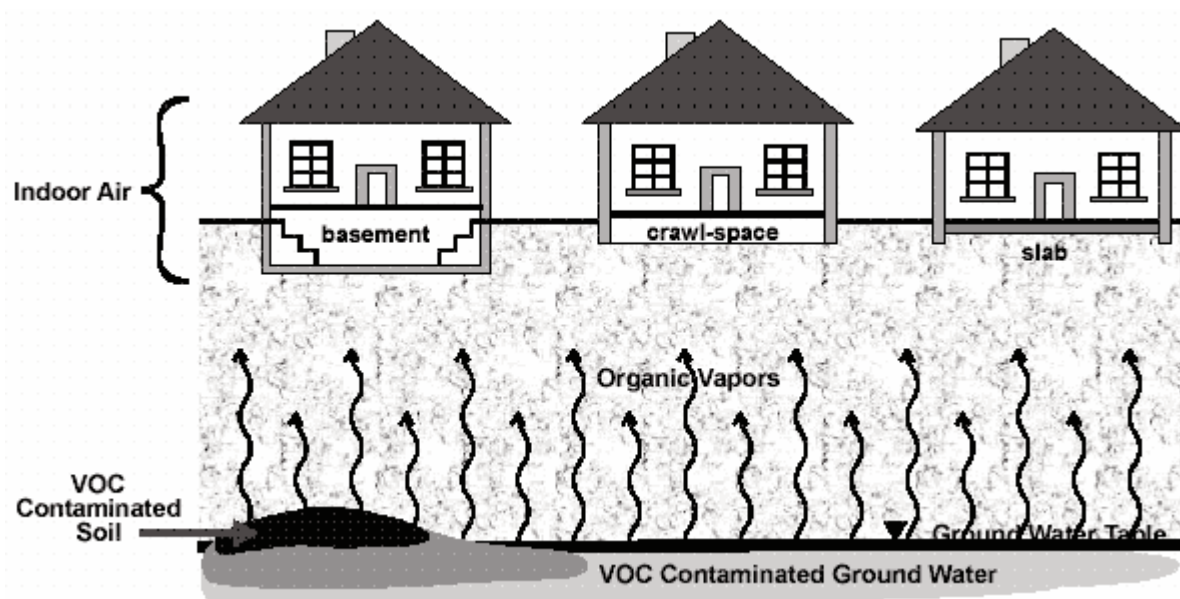


Diagram adapted from USEPA's Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Ground Water and Soils, November 2002

A variety of factors can influence whether vapor intrusion will occur at a building located near soil or ground water contaminated with chlorinated solvents. These include, but are not limited to, the concentration of the contaminants, the type of soil, the depth to ground water, the construction of the building, the condition of the foundation or slab and the existence of underground utilities that can create pathways for vapors to travel.

Short term exposure to high levels of volatile compounds can cause eye and respiratory irritation, headache and/or nausea. Breathing low levels of organic vapors over a long period of time may increase an individual's risk for respiratory ailments, cancer, or other health problems. Volatile compounds may be present inside a building at potentially harmful levels without being detectable by odor. Sub-slab soil gas testing, near-slab soil gas testing and/or indoor air testing are usually required to determine whether vapor intrusion is occurring at a property.

Testing for vapor intrusion

If your home or building is located near a potential source of volatile compound-contaminated soil or ground water, EPA or an environmental contractor may ask permission to evaluate your property for vapor intrusion. This process typically involves conducting sub-slab soil gas testing to check for vapors beneath the building and indoor air testing. During sub-slab testing, a small hole is bored through the basement floor or slab and a sample of the soil gas (the air trapped between the soil particles) is collected using an evacuated air testing canister (see below). If it is not possible to collect a soil gas sample from beneath the floor or slab, the sample may be collected by placing a probe in the soil directly adjacent to the building (near-slab

testing). The soil gas sample is then sent to a certified laboratory to be analyzed.



Use of a rotary hammer drill to create holes for sub-slab vapor probes.



An evacuated air testing canister.

During indoor air testing, a canister collects sub-slab or indoor air samples for a period of time (normally 8 or 24 hours). If the analysis of the sample shows that volatile compounds related to the subsurface contamination are present above screening levels, vapor intrusion is likely occurring. Additional evaluation of the property may be needed to confirm this finding.

Background contamination

Many materials and substances commonly found in commercial and residential settings, such as paints, paint thinners, gasoline-powered machinery, certain building materials and cleaning products, dry cleaned clothing and cigarette smoke, contain volatile organic compounds (e.g., chlorinated solvents) that may be detected by indoor air testing. Even VOCs from motor vehicle emissions and other outdoor sources can contaminate indoor air. When VOCs from these sources are detected during indoor air testing, they are referred to as background concentrations.

Sometimes it can be difficult to determine whether the VOCs detected inside a building are due to vapor intrusion, background contamination, or a combination of both. Before your building is evaluated for vapor intrusion we will coordinate this effort with you to minimize background contamination and help ensure that the test results are as definitive as possible.

Addressing Vapor Intrusion

If testing confirms vapor intrusion is causing potentially harmful levels of volatile compounds to accumulate inside a building, a subsurface depressurization system may be installed at the property.

The system prevents vapors from entering the building by continuously venting the contaminated air beneath the basement slab or crawl space to the exterior of the

structure. Subsurface depressurization systems are also used throughout the country to reduce levels of naturally occurring radon gas in buildings.

EPA intends to start conducting building surveys, preparing sampling locations, and conducting sampling during September 2016.

For More Information

If you have any questions, please feel free to call Katrina Higgins-Coltrain at (214) 665-8143 or Todd Downham at (405) 702-5136. Thank you in advance for your cooperation.